

Amendments to the Specification

Please delete the heading "DESCRIPTION" on page 1, line 1.

Please add the following heading after the title of the invention on page 1, line 2:

Background of the Invention

Please replace the paragraph beginning on page 1, line 16 through line 21, which starts with "On the other hand" with the following rewritten paragraph:

On the other hand, recently, there has also been proposed an electric intake system in which an electric motor is coupled to throttle valves via a link mechanism or the like, a A throttle grip rotating operation of a rider is detected, and all the throttle valves are opened and closed by the electric motor according to this detected rotating operation.

Please replace the paragraphs beginning on page 2, line 3 through line 17, which start with "However, there is a demand that" with the following rewritten paragraphs:

However, there is a demand that, depending upon a running state, for example at the time of ~~approach to~~ approaching a corner or at the time of rising from the corner, for example, it is desired to make the engine brake slightly weak even in the case in which the throttle grip is closed suddenly or it is desired to make the rising of a torque slightly gentle even in the case ~~in~~ which the throttle grip is opened suddenly. In the conventional system, such a demand is coped with by a throttle grip rotating operation of a rider. However, this results in a problem ~~in that the rider is required~~ requiring of an excessively high level driving operation from the rider.

The present invention has been devised in view of the conventional situation, and it is an ~~object~~ advantage of the present invention to provide a ~~fuel feed~~ an intake system for an engine that can obtain an output characteristic corresponding to a running state without requiring ~~a rider~~ of a very high level driving operation from the rider.

Please replace the heading on page 2, line 19, with the following rewritten heading:

~~Disclosure~~ Summary of the Invention

Please replace the paragraphs beginning on page 2, line 20 through page 6 line 17, which start with "An invention of claim 1 is" with the following rewritten paragraphs:

~~An invention of claim 1 is~~ According to an embodiment of the present invention, an intake system for an engine ~~that includes~~ has plural throttle bodies having throttle valves for changing an intake passage area, ~~characterized in that the~~ The plural throttle bodies are constituted by include manually driven side throttle bodies having manually driven side throttle valves, which are opened and closed by a throttle operation of a rider, ~~and~~ The plural throttle bodies also include an electrically driven side throttle body having an electrically driven side throttle valve, which is opened and closed by an electric motor, and the intake system includes a valve opening control ~~means~~ device that ~~controls an opening of~~ closes the electrically driven side throttle valve such that ~~a specific output characteristic corresponding to an operating state of an engine is obtained~~ in a manner delayed by a first time constant within a range up to a predetermined regulated opening as the manually driven side throttle valves close.

~~Here, in the present invention, controlling an opening of the electrically driven side throttle valve such that a specific output characteristic corresponding to an operating state of an engine means controlling an opening of the electrically driven side throttle valve such that, for example, in the case in which a throttle grip is closed suddenly, in the case in which a gear is shifted down in a state of the closed throttle grip, or in the case in which these operations are performed while the brake is further applied, generation of engine brake can be controlled appropriately or such that rising of an engine torque in the case in which the throttle grip is opened suddenly can be controlled.~~

~~In addition, the present invention is applicable to both an intake system of a carburetor type, in which a fuel feed amount is controlled by a depression at engine manifold caused by opening and closing of the throttle valves, and an intake system of a fuel injection type, in which a fuel feed amount is controlled by a fuel injection valve.~~

~~An invention of claim 2 is an intake system for an engine according to claim 1, characterized in that the~~ The valve opening control-means device closes the electrically driven side throttle valve in a manner delayed by a first time constant as the manually driven side throttle valves close changes a delay by the first time constant at the time when the brake is actuated so as to be larger than the delay by the first time constant at the time when the brake is not actuated or changes the regulated opening at the time when the brake is actuated so as to be larger than a regulated opening at the time when the brake is not actuated.

~~An invention of claim 3 is an intake system for an engine according to claim 2, characterized in that the The valve opening control means device closes the electrically driven side throttle valve in a manner delayed by a first time constant within a range up to a predetermined regulated opening as the manually driven side throttle valves close temporarily opens the electrically driven side throttle valve to a predetermined shift-down time opening at the time of shifting-down and subsequently closes the electrically driven side throttle valve in a manner delayed by a the first time constant.~~

~~An invention of claim 4 is an intake system for an engine according to claim 2 or 3, characterized in that the valve opening control means changes a delay by the first time constant at the time when the brake is actuated so as to be larger than the delay by the first time constant at the time when the brake is not actuated or changes the regulated opening at the time when the brake is actuated so as to be larger than a regulated opening at the time when the brake is not actuated.~~

~~An invention according to claim 5 is an intake system for an engine according to claim 2 or 4, characterized in that the valve opening control means temporarily opens the electrically driven side throttle valve to a predetermined shift down time opening at the time of shift down and subsequently closes the electrically driven side throttle valve in a manner delayed by the first time constant.~~

An intake system for an engine includes plural throttle bodies having throttle valves for changing an intake passage area. The plural throttle bodies are constituted by manually driven side throttle bodies having manually driven side throttle valves, which are opened and closed by a throttle operation of a rider. The plural throttle bodies also includes an electrically driven side throttle body having an electrically driven side throttle valve, which is opened and closed by an electric motor. The intake system includes a valve opening control device, which controls an opening of the electrically driven side throttle valve such that a specific output characteristic corresponding to an operating state of an engine is obtained, and learns fully-closed positions of the manually driven side throttle valves and the electrically driven side throttle valve to make the fully-closed positions identical with each other when a speed is lower than a predetermined learning time speed. An opening of the manually driven side throttle valves is smaller than a predetermined learning time opening.

Here, the learning of the fully-closed positions is performed by, for example, in the case detected openings of the manually driven side and the electrically driven side throttle valves are larger than a fully-closed opening stored value, keeping the stored value as it is, and in the case the openings are smaller than the fully-closed opening stored value, updating the stored value.

~~An invention according to claim 6 is an intake system for an engine according to claim 1, characterized in that the valve opening control means opens the electrically driven side throttle valve in a manner delayed by a second time constant as the manually driven side throttle valves open.~~

~~An invention according to claim 7 is an intake system for an engine according to any one of claims 1 to 6, characterized in that the valve opening control means makes an opening of the electrically driven side throttle valve identical with an opening of the manually driven side throttle valves when a vehicle speed is lower than a predetermined control lower limit speed or a gear is in neutral.~~

~~An invention according to claim 8 is an intake system for an engine according to any one of claims 1 to 7, characterized in that the intake system learns fully closed positions of the manually driven side throttle valves and the electrically driven side throttle valve to make the fully closed positions identical with each other when a vehicle speed is lower than a predetermined learning time vehicle speed and an opening of the manually driven side throttle valves is smaller than a predetermined learning time opening.~~

~~Here, the learning of the fully closed positions is performed by, for example, in the case in which detected openings of the manually driven side and the electrically driven side throttle valves are larger than a fully closed opening stored value, keeping the stored value as it is, and in the case in which the openings are smaller than the fully closed opening stored value, updating the stored value.~~

~~An invention according to claim 9 is an intake system according to any one of claims 1 to 8, characterized in that the intake system learns a fully closed position and a fully opened position of the electrically driven side throttle valve and drives the electric motor only between the learned fully closed position and fully opened position.~~

~~Here, the learning of the fully closed position is performed by, for example, in the case in which a detected opening of the electrically driven side throttle valve is larger than a fully closed opening stored value, keeping the stored value as it is, and in the case in which the opening is~~

~~smaller than the fully closed opening stored value, updating the stored value. In addition, the learning of the fully opened position is performed by, for example, in the case in which a detected opening of the electrically driven side throttle valve is smaller than a fully opened opening stored value, keeping the stored value as it is, and in the case in which the opening is larger than the fully opened opening stored value, updating the stored value.~~

~~An invention of claim 10 is an intake system for an engine according to any one of claims 1 to 9, characterized in that the intake system further includes a mechanical return mechanism that forcibly closes the electrically driven side throttle valve to a predetermined return opening as the manually driven side throttle valves close.~~

~~An invention of claim 11 is an intake system for an engine according to claim 10, characterized in that the intake system learns a return opening range, in which the electrically driven side throttle valve is forcibly closed by the return mechanism, and drives the electric motor only in an opening range excluding the learned return opening range.~~

The intake system learns a fully-closed position and a fully-opened position of the electrically driven side throttle valve and drives the electric motor only between the learned fully-closed position and fully-opened position.

An intake system for an engine includes plural throttle bodies having throttle valves for changing an intake passage area. The plural throttle bodies are constituted by manually driven side throttle bodies having manually driven side throttle valves, which are opened and closed by a throttle operation of a rider, and an electrically driven side throttle body having an electrically driven side throttle valve, which is opened and closed by an electric motor. The intake system includes a valve opening control device, which controls an opening of the electrically driven side throttle valve such that a specific output characteristic corresponding to an operating state of an engine is obtained, and includes a mechanical return mechanism that forcibly closes the electrically driven side throttle valve to a predetermined return opening as the manually driven side throttle valves close.

The intake system learns a return opening range, in which the electrically driven side throttle valve is forcibly closed by the return mechanism, and drives the electric motor only in an opening range excluding the learned return opening range.

An intake system for an engine includes plural throttle bodies having throttle valves for changing an intake passage area. The plural throttle bodies are constituted by manually driven

side throttle bodies having manually driven side throttle valves, which are opened and closed by a throttle operation of a rider and an electrically driven side throttle body having an electrically driven side throttle valve, which is opened and closed by an electric motor. The intake system includes a valve opening control device that closes the electrically driven side throttle valve in a delayed manner as the manually driven side throttle valves close and changes a delay at the time when the brake is actuated so as to be larger than the delay at the time when the brake has not been actuated.

An intake system for an engine includes plural throttle bodies having throttle valves for changing an intake passage area. The plural throttle bodies are constituted by manually driven side throttle bodies having manually driven side throttle valves, which are opened and closed by a throttle operation of a rider and an electrically driven side throttle body having an electrically driven side throttle valve, which is opened and closed by an electric motor. The intake system includes a valve opening control device that closes the electrically driven side throttle valve in a delayed manner as the manually driven side throttle valves close and temporarily opens the electrically driven side throttle valve to a predetermined shift-down time opening at the time of shifting-down and subsequently closes the electrically driven side throttle valve later than the manually driven side throttle valves.

An intake system for an engine includes plural throttle bodies having throttle valves for changing an intake passage area. The plural throttle bodies are constituted by manually driven side throttle bodies having manually driven side throttle valves, which are opened and closed by a throttle operation of a rider, and an electrically driven side throttle body having an electrically driven side throttle valve, which is opened and closed by an electric motor. The intake system includes a valve opening control device that closes the electrically driven side throttle valve in a manner delayed within a range up to a predetermined regulated opening as the manually driven side throttle valves close.

The valve opening control device closes the electrically driven side throttle valve in a manner delayed by a first time constant as the manually driven side throttle valves close. The valve opening control device opens the electrically driven side throttle valve in a manner delayed by a second time constant as the manually driven side throttle valves open. The valve opening control device makes an opening of the electrically driven side throttle valve identical with an

opening of the manually driven side throttle valves when a speed is lower than a predetermined control lower limit speed or a gear is in neutral.

Please replace the paragraph beginning on page 6, line 20 through line 21, which starts with “Fig. 1 is a plan view” with the following rewritten paragraph:

Fig. 1 is a plan view showing a carburetor unit of a fuel feed system according to an embodiment of the present invention.

Please replace the paragraph beginning on page 7, line 10 through line 11, which starts with “Fig. 11 is a block diagram” with the following rewritten paragraph:

Fig. 11 is a block diagram of the fuel feed system according to an embodiment of the present invention.

Please replace the heading on page 7, line 18, with the following rewritten heading:

~~Best Mode for Carrying Out~~ Detailed Description of the Invention

Please replace the paragraph beginning on page 7, line 21 through line 28, which starts with “Figs. 1 to 14 are diagrams” with the following rewritten paragraph:

Figs. 1 to 14 are diagrams for explaining an intake system for a motorcycle engine according to an embodiment of the present invention. Figs. 1 and 2 are a plan view and a front view of the intake system, Figs. 3 and 4 are sectional side views of the intake system, Figs. 5 and 6 are enlarged views of the main parts, Figs. 7 to 10 are characteristic charts of a throttle opening for explaining various operations, Fig. 11 is a block diagram, and Figs. 12 to 14 are flowcharts for explaining the operations.

Please replace the paragraphs beginning on page 10, line 4 through page 11, line 5, which start with “The return mechanism 12” with the following rewritten paragraphs:

The return mechanism 12 has a detailed structure described below. A link member 12b implanted with a pressing bolt 12a is fixed at the right end of the drive shaft 7, and a cylindrical transmission member 12c is mounted further on a tip side of the drive shaft 7 more than the link member 12 so as to be rotatable relatively. A pressing piece 12d is protrudingly provided in the

transmission member 12c so as to be able to be pressed by the pressing bolt 12a. Moreover, a pressing piece 12d', which is protrudingly provided in the transmission member 12c, is coupled to the arm 10c of the link mechanism 10 via a transmission bolt 12e and a spring 12f.

Here, Figs. 5 and 6 show a state in the case in which the first to the fourth throttle valves 2b to 5b are in a fully-opened state. In this case, an offset opening of about 30 degrees is formed between the pressing bolt 12a and the pressing piece 12d. Thus, the pressing bolt 12a does not come into abutment against the pressing piece 12d while the manually driven side throttle valves 2b to 4b close about 30 degrees from a fully opened position. Therefore, it is not until the manually driven side throttle valves 2b to 4b rotate about 30 degrees or more from the fully opened position that the transmission member 12c also rotates. This rotation starts to forcibly close the electrically driven side throttle valve 5b from the pressing piece 12d' via the arm 10c, the link 10b, and the arm 10a. In addition, the electrically driven side throttle valve 5b is still located at a position with a return opening of about 45% at a point when the manually driven side throttle valves 2b to 4b are fully closed.

In addition, a manually driven side openings 13, which detects an opening of the throttle valve 2b, is mounted at the left end in Fig. 1 of the valve shaft 2c of the manually driven side throttle valve 2b of the first carburetor 2.

Please replace the paragraph beginning on page 11, line 13 through line 22, which starts with "As shown in Fig. 11" with the following rewritten paragraph:

As shown in Fig. 11, the system of this embodiment includes an ECU 15 that functions as an opening control means device for the electrically driven side throttle valve 5b. Detection signals from the manually driven side opening sensor 13, the electrically driven side opening sensor 14, a ~~vehicle~~ speed sensor 16, a brake pressure sensor 17, and a shift position sensor 18 are inputted to this ECU 15. The ECU 15 calculates an opening instruction value of the electrically driven side throttle valve 5b according to a vehicle drive state and outputs a control signal for realizing the opening instruction value to the electric motor 11.

Please replace the paragraph beginning on page 12, line 8 through page 13 line 1, which starts with "In the system of this embodiment" with the following rewritten paragraph:

In the system of this embodiment, while a motorcycle is running with a throttle grip fully opened (all throttle valves fully opened) and in a state of a shift position in a sixth speed, in the case in which a rider fully closes the throttle grip suddenly and changes the shift position from the sixth speed to a fifth speed, ..., a first speed to decelerate the motorcycle, throttle valve opening control shown in Fig. 7 is performed. The manually driven side throttle valves 2b to 4b are fully closed immediately (actually, about 0.05 seconds are necessary as described later) by the throttle grip fully closing operation (see a the characteristic curve A). On the other hand, the electrically driven side throttle valve 5b is forcibly closed to in the vicinity of an opening 45% with a delay of a very short time by the function of the return mechanism 12 (see B0 of a the characteristic curve B). Thereafter, the electrically driven side throttle valve 5b is closed in a manner delayed by a first time constant by the function of the ECU 15 (see B1 of the characteristic curve B), temporarily opened to a shift-down time opening (e.g., about 45%, B2' of the characteristic curve B) when the motorcycle is decelerated from the sixth speed to the fifth speed, closed again in a manner delayed by the first time constant, and finally regulated to a regulated opening equivalent to about 20% of the full open (see B3 of the characteristic curve B).

Please replace the paragraph beginning on page 13, line 7 through line 18, which starts with "Fig. 8 shows an instance" with the following rewritten paragraph:

Fig. 8 shows an instance when the throttle grip is closed in enlargement (with a time axis extended). That is, when the manually driven side throttle valves 2b to 4b start closing as the throttle grip is closed, according to an elapse of time corresponding to the offset opening (transmission free range) in the return mechanism 12 (see B0' in Fig. 8), the electrically driven side throttle valve 5b also starts closing. When the manually driven side throttle valves are fully closed, the electrically driven side throttle valve has an opening of about 45%. Here, the forcible closing operation ends, and after that, the electrically driven side throttle valve closes in a manner delayed by the first time constant (slowly) according to the control of the ECU 15.

Please replace the paragraph beginning on page 14, line 19 through page 15, line 16, which starts with "First, an operation for alignment" with the following rewritten paragraph:

First, an operation for alignment of fully-closed positions for the manually driven side and the electrically driven side throttle valves will be explained on the basis of Fig. 12. When a

the program begins, in the case in which an opening at the time of a full ~~close~~ closure of the electrically driven side throttle valve (DBW) has not been learned (step S1), it is judged whether a ~~vehicle~~ speed does not exceed a set value (learning time lower limit speed) and an opening of the manually driven throttle valves exceeds a set value (learning time lower limit opening) (step S2). If both the ~~vehicle~~ speed and the manually driven side throttle valve opening do not exceed the set values, that is, if the speed is sufficiently low and the throttle opening is sufficiently small, the ECU 15 outputs a duty in a direction for closing the electrically driven side throttle valve (step S3). If the detected opening of the electrically driven side throttle valve is larger than a fully-closed opening stored value of the valve, the ECU 15 keeps the stored value as it is, and if the opening of the electrically driven side throttle valve is smaller than the fully-closed opening stored value, the ECU 15 updates the fully-closed opening stored value to the detected value (steps S4 and S5). When a predetermined set time elapses, the ECU 15 ends fully-closed opening learning for the electrically driven side throttle valve (steps S6 and S7). Then, the ECU 15 performs alignment of fully-closed positions on the basis of the manually driven side throttle valve fully-closed opening and the learned fully-closed opening of the electrically driven side throttle valve (step S8).

Please replace the paragraphs beginning on page 16, line 4 through page 17, line 1, which start with "Next, the opening instruction" with the following rewritten paragraphs:

Next, the opening instruction value calculation processing for the electrically driven side throttle valve 5b will be explained on the basis of Fig. 13. When a program for the processing begins, if a shift position of a transmission is not neutral (step S21), a vehicle speed is not equal to or lower than the set value (control lower limit speed) (step S22), a shift-down operation is not being performed (step S23), a brake is not being actuated (step S24), an electrically driven side throttle valve opening is not smaller than the regulated opening (B3) (step S25), a throttle valve is not being opened (step S26), and the brake is not being applied again (step S27), that is, a motorcycle is running at a ~~normal~~ constant speed normally, the ECU 15 sets a value obtained by applying a predetermined filter to the detected opening of the manual side throttle valves, that is, the opening, which is obtained by delaying the opening of the manual side throttle valves by the first time constant (B1), as the opening instruction value of the electrically driven side throttle valve (step S28).

If the shift position is neutral in step S21, and if the ~~vehicle~~ speed is lower than the control lower limit speed in step S22, the ECU 15 sets the same opening as the manually driven side throttle valve opening as the electrically driven side throttle valve opening instruction value (step S29). If the shift-down operation is performed in step S23, the ECU 15 sets the shift-down time opening set value (B2' in Fig. 7) as the opening instruction value of the electrically driven side throttle valve (step S30).

Please replace the paragraph beginning on page 17, line 14 through line 24, which starts with "Moreover, if the manually" with the following rewritten paragraph:

Moreover, if the manually driven side throttle valve is being opened in step S26, the ECU 15 sets an opening, which is obtained by delaying the detected manually driven side throttle valve opening by the second time constant (an opening obtained by filtering the manually driven side throttle valve opening, see the curve C in Fig. 10), as the opening instruction value of the electrically driven side throttle valve (step S34). If the brake is being applied in step S27, the ECU 15 sets an opening, which is obtained by delaying by the ~~brake actuation time constant~~ detected manually driven side throttle valve opening by the brake actuation time constant (B1 in Fig. 9) (an opening obtained by filtering the manually driven side throttle valve opening), as the instruction value (step S35).

Please replace the paragraph beginning on page 18, line 18 through line 26, which starts with "Detection processing for" with the following rewritten paragraph:

Detection processing for a movable range of the electrically driven side throttle valve will be explained on the basis of Fig. 14. First, a detected electrically driven side throttle valve opening is compared with a fully-closed opening stored value of the electrically driven side throttle valve. If the detected value is larger than the stored value, the stored value is not changed, and if the detected value is not larger (is smaller) than the stored value, the stored value is replaced with the detected value (steps S51 and S52).

Please replace the paragraphs beginning on page 19, line 21 through page 20 line 24, which start with "More specifically" with the following rewritten paragraphs:

More specifically, the electrically driven side throttle valve 5b is closed in a manner delayed by the first time constant (see B1 in Fig. 7) as the manually driven side throttle valves 2b to 4b close according to a throttle grip operation of the rider, and not ~~to close~~ closed exceeding the regulated opening (B3 in Fig. 7). Thus, even in the case in which the rider closes the throttle grip suddenly, the electrically driven side throttle valve 5b closes later than the throttle grip operation, and generation of the engine brake can be controlled so much more for that. Therefore, the rider is not required an excessively high level driving operation, and a driving operation is facilitated.

In addition, the first time constant at the time when the brake is actuated (B1 in Fig. 9) is changed to a time constant that makes the delay larger than that of the time constant at the time when the brake is not actuated (B1' in Fig. 9), and the regulated opening at the time when the brake is actuated (B3) is changed so as to be larger than the regulated opening at the time when the brake is not actuated (B3'). Thus, in the case in which the rider actuates the brake device, generation of the engine brake is controlled stronger than in the case in which the rider does not actuate the brake device, and a driving operation can be facilitated.

It is said that, in general, or depending upon the preference of ~~in~~ the driving operation of the rider, driving is easier when the engine brake is not generated much in the case in which a brake is applied strongly. In this embodiment, the system can cope with such a situation as well.

The electrically driven side throttle valve 5b is temporarily opened to a predetermined shift-down time opening (B2' in Fig. 7) and subsequently closed in a manner delayed by the first time constant (B1). Thus, shock due to a sudden increase in engine ~~brake~~ braking at the time of ~~shift~~ shifting-down can be eased, and driving can be facilitated.

Please replace the paragraph beginning on page 21, line 3 through line 10, which starts with "Further, an opening" with the following rewritten paragraph:

Further, an opening of the electrically driven side throttle valve 5b is made identical with an opening of the manually driven side throttle valves 2b to 4b when a vehicle speed is lower than a predetermined control lower limit speed or when a gear is in neutral. Thus, it is possible to avoid unnecessary control in a driving range in which special control for a throttle valve opening is not originally required as at the time of low-speed running or neutral, and a control mechanism can be simplified.

Please delete the heading "Industrial Applicability" on page 22, line 21.

Please replace the paragraphs beginning on page 22, line 22 through page 26, line 4, which start with "According to the invention of claim 1" with the following rewritten paragraphs:

~~According to the invention of claim 1, the plural throttle bodies include manually driven side throttle bodies and electrically driven side throttle body, and the intake system controls an opening of the electrically driven side throttle valve such that a specific output characteristic corresponding to an operating state of an engine is obtained. Thus, generation of engine brake, for example, in the case in which a throttle grip is closed suddenly or in the case in which a gear is shifted down can be controlled, or rising of an engine torque in the case in which the throttle grip is opened suddenly can be controlled. An output characteristic corresponding to a driving condition can be obtained without requiring a rider of an excessively high level driving operation, and a driving operation can be facilitated.~~

~~According to the second invention of claim 2, the electrically driven side throttle valve is closed in a manner delayed by a first time constant as the manually driven side throttle valves close. Thus, even in the case in which a rider closes the throttle grip suddenly, the electrically driven side throttle valve closes later than a throttle grip operation, and generation of engine brake can be controlled so much more for that.~~

~~According to the invention of claim 3, in the case in which the electrically driven side throttle valve is closed in a manner delayed by a first time constant as the manually driven side throttle valves close, the electrically driven side throttle valve is closed in a range up to a predetermined regulated opening. Thus, generation of engine brake can be controlled more surely.~~

~~According to the invention of claim 4, a delay by the first time constant at the time when the brake is actuated is changed so as to be larger than the delay by the first time constant at the time when the brake is not actuated or the regulated opening at the time when the brake is actuated is changed so as to be larger than a regulated opening at the time when the brake is not actuated. Thus, in the case in which a rider actuates a brake device, generation of engine brake is controlled more strongly than in the case in which the rider does not actuate the brake device, and a driving operation can be further facilitated. It is said that, in general, or depending upon~~

~~preference of in driving operation of the rider, driving is easier when engine brake is not generated much in the case in which a brake is applied strongly. The present invention can facilitate driving in such a case.~~

~~According to the invention of claim 5, at the time of shift down, the electrically driven side throttle valve is temporarily opened to a predetermined shift down time opening and subsequently closed in a manner delayed by the first time constant. A sudden increase in engine brake at the time of shift down can be controlled, and shock at the time of shift down can be eased to facilitate deriving.~~

~~According to the invention of claim 6, the electrically driven side throttle valve is opened in a manner delayed by a second time constant as the manually driven side throttle valves open. Thus, even in the case in which a rider opens the throttle grip suddenly, excessively steep rising of an engine torque can be controlled, and a driving operation can be facilitated.~~

~~According to the invention of claim 7, an opening of the electrically driven side throttle valve is made identical with an opening of the manually driven side throttle valves when a vehicle speed is lower than a predetermined control lower limit speed or when a gear is in neutral. Thus, it is possible to avoid unnecessary control in a driving range in which special control for a throttle valve opening is not originally required as at the time of low speed running or neutral.~~

~~According to the invention of claim 8, the intake system learns fully closed positions of the manually driven side throttle valves and the electrically driven side throttle valve when a vehicle speed is lower than a predetermined learning time speed and an opening of the manually driven side throttle valves is smaller than a predetermined learning time opening. Thus, the learning of the fully closed positions can be performed surely. In addition, the fully closed positions are made identical with each other according to the learned value, whereby even if there is an error between a manually driven side throttle opening sensor and an electrically driven side throttle opening sensor, both the throttle valves can be synchronized, and control accuracy can be improved.~~

~~According to the invention of claim 9, the intake system learns a fully closed position and a fully opened position of the electrically driven side throttle valve and drives the electric motor only between the learned fully closed position and fully opened position. Thus, lock~~

~~breakage of the electric motor, which is caused by driving the electrically driven side throttle valve exceeding the fully closed position and the fully opened position, can be avoided.~~

~~According to the invention of claim 10, the intake system further includes a mechanical return mechanism that forcibly closes the electrically driven side throttle valve to a predetermined return opening as the manually driven side throttle valves close. Thus, control by the electric motor is also unnecessary for the electrically driven side throttle valve up to the return opening, and control for an opening of the electrically driven throttle valves can be simplified.~~

~~According to the invention of claim 11, the intake system drives the electric motor only in an opening range excluding a return opening range in which the electrically driven side throttle valve is forcibly closed by the return mechanism. Thus, lock breakage of the electric motor can be avoided.~~

The electrically driven side throttle valve is closed in a delayed manner as the manually driven side throttle valves close. Thus, even in the case in which a rider closes the throttle grip suddenly, the electrically driven side throttle valve closes later than a throttle grip operation, and generation of the engine brake can be controlled so much more for that.

In addition, in the case in which the electrically driven side throttle valve is closed in a delayed manner as the manually driven side throttle valves close, the electrically driven side throttle valve is closed in a range up to a predetermined regulated opening. Thus, generation of the engine brake can be controlled more surely.

A delay at the time when the brake is actuated is changed so as to be larger than the delay at the time when the brake is not actuated or the regulated opening at the time when the brake is actuated is changed so as to be larger than a regulated opening at the time when the brake is not actuated. Thus, in the case in which a rider actuates a brake device, generation of the engine brake is controlled more strongly than in the case in which the rider does not actuate the brake device, and a driving operation can be further facilitated. It is said that, in general, or depending upon the preference in the driving operation of the rider, driving is easier when the engine brake is not generated much in the case in which a brake is applied strongly. The present invention can facilitate driving in such a case.

The electrically driven side throttle valve is temporarily opened to a predetermined shifting-down time opening at the time of shifting-down and subsequently closed later than the

manually driven side throttle valves. Thus, a sudden increase in the engine brake at the time of shifting-down can be controlled, and shock at the time of shifting-down can be eased to facilitate driving.

The intake system learns fully-closed positions of the manually driven side throttle valves and the electrically driven side throttle valve when a speed is lower than a predetermined learning time speed and an opening of the manually driven side throttle valves is smaller than a predetermined learning time opening. Thus, the learning of the fully-closed positions can be performed surely. In addition, the fully-closed positions are made identical with each other according to the learned value, whereby even if there is an error between a manually driven side throttle opening sensor and an electrically driven side throttle opening sensor, both the throttle valves can be synchronized, and control accuracy can be improved.

The intake system learns a fully-closed position and a fully-opened position of the electrically driven side throttle valve and drives the electric motor only between the learned fully-closed position and fully-opened position. Thus, lock breakage of the electric motor, which is caused by driving the electrically driven side throttle valve exceeding the fully-closed position and the fully-opened position, can be avoided.

The intake system further includes a mechanical return mechanism that forcibly closes the electrically driven side throttle valve to a predetermined return opening as the manually driven side throttle valves close. Thus, control by the electric motor is also unnecessary for the electrically driven side throttle valve up to the return opening, and control for an opening of the electrically driven throttle valves can be simplified.

The intake system drives the electric motor only in an opening range excluding a return opening range in which the electrically driven side throttle valve is forcibly closed by the return mechanism. Thus, lock breakage of the electric motor can be avoided.

In the case in which a rider actuates a brake device, generation of the engine brake is controlled more strongly than in the case in which the rider does not actuate the brake device, and a driving operation can be further facilitated.

Shock due to a sudden increase in the engine brake at the time of shifting-down can be eased, and driving can be facilitated.

Even in the case in which a rider closes the throttle grip suddenly, the electrically driven side throttle valve closes later than a throttle grip operation, and generation of the engine brake

can be controlled so much more for that. Therefore, the rider is not required of an excessively high level driving operation, and a driving operation is facilitated.

Even in the case in which a rider opens the throttle grip suddenly, excessively steep rising of an engine torque can be controlled, and a driving operation can be facilitated.

It is possible to avoid unnecessary control in a driving range in which special control for a throttle valve opening is not originally required as at the time of low-speed running or neutral, and a control mechanism can be simplified.